UNITED
NATIONS

TD

United Nations
Conference
on Trade and
Development

Distr.
GENERAL

TD/B/COM.3/EM.5/2
26 June 1998

Original: ENGLISH

TRADE AND DEVELOPMENT BOARD
Commission on Enterprise, Business
Facilitation and Development
Expert Meeting on Clustering and
Networking for SME Development
Geneva, 2-4 September 1998
Item 3 of the provisional agenda

PROMOTING AND SUSTAINING SMEs CLUSTERS AND NETWORKS FOR DEVELOPMENT

Issues paper by the UNCTAD secretariat

Executive Summary

The analysis and case studies presented in this issues paper suggest that clustering and networking are among the best options to support the growth of SMEs and their ability to compete effectively in the global economy. This is true in both developed and developing countries. However, not all clusters/networks manage to upgrade technologically nor grow to become world competitors. Some clusters, or firms located within clusters, grow while others stagnate or even regress in their ability to innovate and compete (sect. II). Firms, business associations, governments, donors and other support institutions are all important stakeholders and have a role to play individually and collectively in helping clusters and networks to grow sustainably.

Many lessons have been learned from the best practices presented in this paper in promoting networking and clustering in developing countries (sect. III). While individual firms need to take the lead in restructuring their internal operations and their external linkages with suppliers and customers, other stakeholders can play a supportive role at various levels. Central governments can contribute by creating an enabling macroeconomic environment and infrastructure, while local/regional governments can assist in sustaining the establishment of support service agencies and implementing programmes for networking (sect. IV). Most importantly, each of the actors at the macro, meso and micro levels must become engaged in a common strategy for SMEs development and must play their appropriate role (sect. V).

GE.98-50998 (E)

PROMOTING AND SUSTAINING SMEs CLUSTERS AND NETWORKS FOR DEVELOPMENT

Preface

The Commission on Enterprise, Business Facilitation and Development agreed at its second session (1-5 December 1997), that inter-firm cooperation can be a useful tool in facing the pressures of increasing global competition and in enhancing technological capability and innovativeness, which are essential factors for the development and growth of enterprises, particularly small and medium-sized enterprises (SMEs). In the light of the above considerations, the Commission decided to convene an Expert Meeting on *"The role of support structure - public (ministries, regional governments and agencies) and private (e.g. business associations) - in promoting and sustaining, clustering and networking for SME development, including policy responses to problems for SMEs in access to finance."* The present paper provides background information and raises critical issues which will be discussed during the expert meeting.

I. Introduction

1. In a liberalizing and globalizing world economy, firms and indeed whole economies operate increasingly in markets which demand innovation and flexibility to meet the challenges of constantly changing market conditions. Globalization has brought about growth in the knowledge-intensity of production across all economic activities. Production involves an increasing number of knowledge-intensive activities such as product design, process engineering, quality control, new management routines and organization of production. Firms compete not only on price, but also on the basis of their ability to innovate. Continuous improvement in product, process, technology and organization have thus become the keys to sustained competitiveness in a globalizing economy.

2. The new innovation-based mode of competition has been diffused as markets are liberalized everywhere. SMEs are thus under tremendous pressure to innovate and change, restructure their operations and achieve efficiencies in production. However, they often lack resources to do so. Enterprise clusters and networks are of particular interest to developing countries because they offer specific and important advantages to small firms. Through clusters and networks SMEs can access skilled and highly educated labour and pooled business services. These opportunities permit specialization, build technological capability, adaptability, and innovativeness, and facilitate tacit knowledge flows and learning through interaction processes.

3. Networking is most often used to describe formal and informal cooperation between firms. This may take many forms such as linking firms through knowledge exchange, commercial relationships and competition relationships. Clustering is a spatial concept. Firms are located in proximity to each other, but this does not automatically imply collaboration among them. Physical clustering is quite common in developing countries owing to spontaneous agglomeration phenomena, as well as to earlier policies of creating what the British call "industrial estates" and the French call "zones industrielles". These are again simply collections of disparate firms and services physically located together. There is, however, a need to transform

these clusters into local/regional growth poles reaping the benefits of both physical proximity and networking, thus raising their competitiveness at both the individual firm and systemic level.

4. Industrial districts are a form of enterprise cluster which epitomizes the concept of collective efficiency. 1/ Flexibility, and the existence of strong networks of small firms which result in specialization and subcontracting, are understood to be their major characteristics. The industrial district model offers a dynamic approach to regional economic development. A major challenge for developing countries is to use the related principles of industrial organization as a lever for local development, by helping local SMEs to take advantage of the opportunities opened up by networking and clustering and thus also generate possibilities for accessing new markets and resources, acquiring new skills and capabilities, and developing an international competitive advantage.

5. In order to achieve this objective, a choice between promoting more formal, artificially constituted clusters - through instruments such as export processing zones (EPZs), science parks, incubators and technopoles - or supporting already existing, spontaneously constituted clusters of small firms has to be made. Emphasis is placed here upon the latter, based on the assumption that the key challenge for the future is the capability "to boost productivity and growth through increased knowledge-intensive economic activities, while maintaining social cohesion and equity" (OECD, 1996). From this point of view, Italian industrial districts can be considered as possible "systems of excellence". They base their competitive advantages - technical know-how, productive capability, creativity and originality - on endogenous strength factors, stemming from deep social roots, often a common history of small-scale agriculture, a tradition of self-employment, a strong sense of identity and cultural belonging.

6. In the last two decades SMEs clustering and networking have been increasingly attracting the attention of academicians, policy makers, trade practitioners and international organizations. The main reason is that in developing countries SMEs constitute the numerically dominant economic actor and contribute one third to one half of gross national product. From the policy point of view, assistance to SMEs has been traditionally considered by national governments and international donors as a way to target aid to the poorest and to create new job opportunities for the most disadvantaged sectors of the population. Today it is also seen as a way to stimulate a thriving private sector and a way to foster economic growth through decentralized and participatory development.

7. Drawing on concrete examples, this issues paper examines the role of support structures in promoting and sustaining enterprise clusters and networks for development. Section II discusses different types of clusters and networks and the implications these may have for policy and other support measures. Section III reviews the merits of the clustering and networking approach to SME development and emphasizes the need for public awareness and support. It draws on selected case studies that offer examples of best practice in supporting already existing and completely new clusters and networks. Section IV reviews implications for policy and support, proposing measures that might be taken at the public, private and technical cooperation

levels to maximize the benefits of networking and clustering. Section V summarizes the lessons learnt from the experiences of the more successful examples of interventions in favour of clustering and networking.

II. Types of clusters and networks

8. There are many types of clusters and networks. Each of these types has a distinct development trajectory, principles of organization and specific problems. For policy makers, different types of clusters or networks will require different policy approaches (Meyer-Stamer, forthcoming). Three broad criteria allow us to draw major distinctions between different types. These are the general level of technology of firms in the cluster, the extensiveness of change in the cluster over time and the degree of coordination and networking among firms located within the cluster. Using these criteria we classified clusters into five types: informal, organized, and innovative clusters, technology parks and incubators, and export processing zones (EPZs).

9. Informal clusters are the predominant forms of clustering in developing countries and in LDCs in particular (see table 1). They generally contain micro and small firms whose technology level is low relative to the industry frontier. Their workers have low skills and little or no continuous learning takes place for sustained skills upgrading. Although low barriers to entry may lead to change in the cluster overtime in terms of the number of firms and supporting institutions located there, this does not necessarily reflect a positive dynamic as measured by upgrading of management skills, introduction of new process technology, machinery and equipment, improvement in product quality, product diversification or the development of exports.

Table 1. Informal clusters

Country	Cluster's location	Specialization	Type*
Bolivia	Santa Cruz de la Sierra	Clothing	Micro- and small-enterprise networks
Burkina Faso	Ouagadougou	Motor vehicle repair; tailoring; electrical repair; blacksmithing; grain milling	Informal clusters
Ghana	Kumasi (Suame Magazine)	Vehicle repair; spare parts manufacturing	Informal cluster
Honduras	San Pedro Sula	Furniture; metalworking; food processing (sauces)	Micro- and small-enterprise networks
Indonesia	Central Java	Palm sugar; vermicelli; roof tiles	Small-scale and cottage industry
Nigeria	Awka Zaria Lagos	Blacksmithing; leather works; woodwork	Informal clusters
Uganda	Katwe and Jinja Iganga	Metalworking; food processing (maize milling)	Formal clusters

Source: Compiled by the UNCTAD secretariat from various sources.

* As given by the researchers who studied the cluster/network.

10. The nature of coordination and networking among firms located in informal clusters tends to be low and is characterized by a limited growth perspective, cut-throat competition, little trust and little information sharing. Poor infrastructure, weak backward, horizontal and forward linkages and a lack of information on foreign markets tend to reinforce this low growth dynamic. The Suame Magazine cluster in Kumasi (Ghana) is one example of an informal cluster which became dynamic thanks to the proliferation of linkages among users and suppliers and to networking with research institutions such as the Technology Consultancy Center at the University of Science and Technology in Kumasi. The Government, after initial opposition to the mushrooming of informal workshops in Suame Magazine, moved to support their development through the provision of technology services, training and credit, a point to which we return in section III.

11. These linkages generated considerable technology capacity-building within the cluster, and this process was reinforced during Ghana's long period of economic crisis by the movement of educated people out of the public sector and into micro and small-scale enterprise. Nonetheless informal clusters such as these are highly fragile. When, towards the end of the 1980s, the IMF structural adjustment programme liberalized imports, including those of used cars, and second hand parts such as engines and foreign currency became more available, the clusters' growth slowed. Hundreds of businesses collapsed and thousands of workers lost their jobs. Businesses which had mutated to manufacturing fared better than others. A lesson was learned that "to survive and prosper, fitters must raise their level of technology and many must change their role from that of repairer to that of manufacturers" (Powell, 1995).

12. Organized clusters are characterized by a process of collective structuring, mainly in terms of infrastructure and services, conceived in order to analyse and face common problems (see table 2). Although most firms in these clusters are small, some have already grown to over 200 employees, and their skills tend to increase through training and apprenticeship. In terms of technological capability they have also upgraded, though few are close to the frontier. What distinguishes the organized cluster is the cooperation and networking that has emerged among member firms. Firms in the cluster started to change and evolve together after realizing that in a liberalized economy they gain advantages if they compete as a group, and not as single units. This has further stimulated dynamism in the cluster.

13. The Nnewi cluster of automobile parts in Nigeria (see sect. III) is an example of how firms located in an informal cluster with no infrastructure have been able to grow, export and upgrade, grouping together and setting up common utilities. Workers' skills were acquired through learning-by-doing, especially during equipment installation and test run, and through inter-firm linkages with foreign technology suppliers (foreign experts came from Taiwan Province of China and Nigerian engineers studied under them). However, as in the Suame Magazine case, analysed previously, vulnerable aspects in the production strategy of the cluster have emerged, especially because firms were not well organized within the cluster to support a continuous process of improvement. Here is where policies and new support structures are needed.

Table 2. Organized clusters

Country	Cluster	Specialization	No. of firms	No. of suppliers	Output exported %	Share of world exports %	Workers	Other salient data
Brazil	Sinos Valley	Shoes (leather)	500	1 000	70	12.3 (1990)	153 000	Exports: US$ 900 million (1992)
India	Tiruppur	Knitwear (cotton)	1 500 (1985)		yes		40 000 (1985)	
Nigeria	Nnewi	Auto spare parts (metal rubber)	17		yes		2 256 (1991)	80% of Nigeria auto spare parts
Pakistan	Sialkot (Punjab)	Surgical instruments	300	1 500	90	20 (1996)		Second world exporter US$ 130 million (1993)

Source: Compiled by the UNCTAD secretariat from various sources.

14. The firms located in the organized cluster in Sialkot (Pakistan) and producing surgical instruments also managed to face the challenges posed by globalization and liberalization processes achieving increasingly high competitiveness at the cluster level (see sect. III). They reacted to external pressures regarding quality by means of collective actions: a delegation of local producers visited Washington after the import restrictions imposed by the United States Government, a local trade association lobbied the Pakistani Government for financial and technical support, a quality assurance consultancy firm was hired and metal testing laboratories and technical training facilities were set up after federal support was made available. In two years the first firm met the ISO quality standards. This process was strongly facilitated by a high degree of linkage within and between different sectors, a progressive specialization in the various production phases, frequent exchange of information and tacit knowledge flows.

15. Innovative clusters are mainly found in developed countries. There are, however, exceptions such as the Indian software cluster in Bangalore (see sect. III), and the emerging Brazilian ceramic tiles clusters in Santa Catarina. Firms in these clusters tend to be centred on knowledge-intensive activities and have the capacity to undertake technology adaptations, to design new products and processes, and to bring them quickly to market. They also have the capacity to keep pace in world competition through continuous innovation in all business functions. This frequently enables firms in these clusters to be global players with very high export ratios.

16. Successful innovative clusters take advantage of their capacity to target niche markets, to improve quality, to use new multi-task production technologies and to introduce rapid changes in the organization of production.

They basically rely on the intermediation of specialized structures to draw upon the codified knowledge made available by new technologies and to blend it with local knowledge and skills. This does not apply only to what are generally regarded as high-tech sectors. Even firms in "traditional" sectors - such as textiles and garments, leather and shoes, or food processing - are obliged to absorb new technologies into design, production and marketing processes if they do not want to become obsolete and decline.

Table 3. Types of clusters and their performance

Types / Features	Informal clusters	Organized clusters	Innovative clusters	Technology parks and incubators	Export processing zones
Examples	Suame Magazine (Kumasi, Ghana)	Sialkot (Punjab, Pakistan)	Bangalore (India)	Business International Incubators (China)	Maquiladora (Mexico)
Technology level	low	medium	high	low and high	low to medium
Skills	low	medium	high	medium	low and medium
Innovation	little	some	high	some	little
Trust	little	high	high	little	little
Cooperation	little	high	high	little	medium
Competition	high	high	high	medium	high
Size of firms	micro	SMEs and large	SMEs and large	SMEs	SMEs and large
Exports	little or none	some to high	high	some	high
Learning	little	medium to high	high (continuous)	high	little to medium

Source: Compiled by the UNCTAD secretariat from various sources.

17. Finally, technology parks and EPZs are local clusters that result from technology and export policies. Technopoles are aimed at establishing spatial agglomerations of high-tech firms and organizations, ranging from large technology research hubs to small regional science parks or incubator centres. Despite successful results at the single enterprise level (such as Hewlett Packard and Apple which started in science park locations) technopoles often lack effective mechanisms to stimulate networking among the firms artificially clustered, or to promote technology transfer capacity to and from the surrounding context. It is generally recognized that technopoles can play the role of technology seed-bed, and perform well in terms of enterprise creation (OECD, 1997). But they are often criticized for being expensive enclaves, concentrating a huge amount of public investment without contributing adequately to the growth of the local economy (Maillat, 1996).

18. Likewise, EPZs have shown little potential to establish positive links with the local economy. They are aimed at attracting foreign firms through direct tax incentives, streamlining export regulations, facilitating business services and providing easy access to infrastructure and transport. Indeed,

they have succeeded in small export-oriented countries such as those in South-East Asia, or in China (Van Heerden, 1998). However, EPZs are characterized by a very low degree of coordination and networking among firms located within the cluster, strict subcontracting relationships, and no backward or forward linkages with the local production system (if not illegal trade). In many developing countries they are locked into a downward spiral, due to low technology levels, low value added, low profitability, high levels of market uncertainty, and volatile investments (Frobel et al., 1987). Most often, the positive effects of a relatively high employment generating capacity are undermined by a high turnover rate, which impedes the qualification of the labour force (mostly low-cost and female), while positive spin-offs of high gross export levels are undermined by the scarcity of foreign exchange earnings and net exports attained (Nurse, 1995).

III. The relevance of clusters and networks for SME development and the need for public support

19. Clustering and networking help SMEs to overcome their major weaknesses - isolation and powerlessness - and to raise their competitive potential through the emergence of linkages between firms providing economies of scale and scope. Rediscovered in the 1960s-1970s, the Italian industrial districts have come to be viewed as the ideal model of an SME cluster. Here, a web of social relations, based on the deepening of industrial and social interdependence, provides the basis for an organization of work characterized by social cohesion, and collaborative and participative principles. This web also promotes the relations of trust and reciprocity necessary for a smooth functioning of networks through formal and informal agreements (Becattini, 1990). Such relationships took decades to establish and were supported by local government institutions.

20. While the industrial district model cannot always be successfully replicated, there are many examples of effective interventions (either from national programmes or international assistance) aimed at fostering collective efficiency and cooperative competition, which have yielded benefits that individual producers can rarely attain on their own. Size has lost much of its importance in explaining economic growth. It is the creation of organizational synergies - the promotion of "connectivity" at a systemic level - which has assumed central importance, together with the local systems in which these synergies develop. Porter (1990) argues that "all around the world, in country after country, the focus of competitive success is increasingly local". The ability to create a unique concentration of local skills, local technology, local infrastructure, and local suppliers in the relevant fields seems to provide the strategic ingredients for competitive success.

21. SME clustering and networking may also represent a strategy to meet the new challenges posed by globalization and liberalization. In their study on the shoe producing cluster of Sinos Valley in Brazil and of the surgical instrument cluster of Sialkot in Pakistan, Nadvi and Schmitz (1997) argue that "either located in specialized geographical clusters, or as a part of geographically dispersed production networks, SMEs may be better placed to capitalize on new competitive pressures. Connectivity and networks matter. Interventions and strategic management make the difference." Industrial

districts, according to Brusco (1990), pass through two stages of development: a phase of spontaneous growth called Mark I, and a second phase emphasizing the need for institutional support called Mark II.

22. An efficient local government and the availability of support structures - the provision of credit, training of workers and entrepreneurs, the provision of a coherent set of collective services to firms, intermediary organizations - are essential in steering enterprises to take what has been defined as "the high road to competitiveness", rather than the "low road" (Pyke and Sengenberger, 1990). In the former, emphasis is placed on sustained innovation, high product quality, functional flexibility and good working conditions as the basis for achieving a competitive edge. In the latter the emphasis is on price competition based on permanent cost and wage reductions. The high road approach requires continuous investment, especially in the labour force, and corresponding risks which have to be "shared" among public and private institutions. SMEs cannot afford to develop new technologies individually, find new markets, train skilled workers and raise capital, all at the same time. However, the rules of "the New Competition" allow only flexibly specialized producers to compete in the global market place, on the basis of product-led competition (rather than price-led), just-in-time principles, teamwork organization and cooperative inter-firm infrastructure (Best, 1990).

23. Clusters of firms are thought to emerge spontaneously, as the result of very specific historical and socio-economic circumstances. It has also been said that "industrial districts never appear by accident, or by chance" (Pezzini, 1996). The European success stories (among which are the Third Italy, Baden-Wüttemberg in Southern Germany, West Jutland in Denmark and South-West Flanders in Belgium), are very helpful in showing how to enable already existing and dynamic clusters to perform even better, or to respond to new challenges. However, many commentators are sceptical about the possibilities of creating from scratch a local productive system of small firms which compete on the basis of collective efficiency.

24. The automobile parts cluster in Nnewi (Nigeria) is an example of an informal cluster which has entered a phase of main change and export growth. But there are limits to this process. Over the past 25 years, local traders in Nnewi have transformed themselves into manufacturers of automobile parts through close linkages to technology suppliers in Taiwan Province of China. Seventeen firms (ranging in size from firms with 40 employees to those with 250) supply Nigeria and other West African markets with switch gears, roller chains for engines, auto tubes, batteries, engine seats, shock absorbers, foot rests and gaskets for motorcycles, as well as other parts. Most of these firms have the design capability to modify products and adapt the production process to the local market. Firms in Nnewi grew despite major infrastructural and credit constraints. Electricity, for example, was only supplied through private generators, water was provided through the company's boreholes, telephone service was poor and tariffs high, land was expensive and scarce, and banks were reluctant to extend the level of credit offered to companies with high inventory costs. Despite all these limitations, Nnewi firms succeeded in innovating, growing and exporting to neighbouring countries while other firms in Nigeria were folding up.

25. At this point, however, external support is needed to reach what Brusco called the Mark II phase of development of the cluster. According to Oyelaran-Oyeyinka (1997), "a weak local capital goods capability continues to slow down a full acquisition of major innovation capability (...)". The kind of public and non-governmental support required ranges from technical services and management consulting, to low-cost information on new products and processes (which is now extremely expensive), to subsidized/decentralized materials testing services. Free or low-cost access to specialized facilities owned by the state (at present underutilized) for complementing private learning efforts by firms is also envisaged. An agreement of this kind was reached for example in Kumasi, where the Intermediate Technology Training Unit of the Technology Consultancy Centre at the University of Science and Technology provided training to upgrade the skills of mechanics in informal workshops and to teach them basic accounting and management methods.

Examples of best practices in supporting existing clusters/networks

26. The evidence indicates that various interventions by public or private institutions can play an important role in helping a cluster or network, once it has emerged, to attain, maintain and enhance competitiveness. The following review of selected case studies - the Bangalore high-tech industrial networks (see box 1) and the Sialkot surgical instruments cluster (see box 2) - provides some examples of effective interventions aimed at fostering the growth and competitiveness (in local and global markets) of SME clusters and networks in developing countries. The case studies have been chosen mainly because of the insight they offer into the role of external and internal support structures in promoting and enhancing competitiveness in already existing clusters and networks.

Box 1: High Technology Industrial Networks in Bangalore, India

Bangalore is effectively the scientific and engineering centre of India. Much of the recent high-tech industrial success of Bangalore is directly related to the close ties that exist between various types of large, medium-sized and small firms in a range of technology intensive industries and local specialist research, training and higher educational institutions. Bangalore is characterized by a dense and interconnected network of ties within and between high technology engineering, electronics, telecommunication, defence and machine tools sectors and local institutions. The primary locational advantage for Bangalore's industries is the highly skilled human capital base and the constant generation and flow of technology-related production ideas.

Unlike most cases of innovative cluster-based or networked SMEs from the South, Bangalore's development as a centre for technology-intensive industries with extensive SME presence is largely a result of an initial (and strategic) locational decision by the central Government. This was followed by public sector investment in large enterprises within technology-intensive sectors and in key support institutions. These government-led interventions set into motion a process whereby over a space of three decades, backward and forward linkages developed, large numbers of skilled technicians and engineers were produced, numerous SMEs producing components or acting as job-working

subcontractors emerged, and high technology industrial players, both local and global, opted to locate in the city.

The easy availability of relatively cheap yet highly skilled technical personnel is a key element in Bangalore's international competitiveness in the knowledge-intensive sectors. Bangalore's engineers have brought about a sustained process of technical innovation across a number of local sectors. In addition to generating extensive backward and downstream linkages locally, large public sector firms often acted as industrial motors driving their sector's growth, providing a training ground for subsequent generations of engineers and skilled technicians and acting as incubators for the development of skills and technical know-how in the industry. Among such large firms are Bharat Electronics (defence), Hindustan Machine Tools Factory, Indian Telephone Industries, Hindustan Aeronautics, and WIPRO (the large private sector computer manufacturer).

Production ties between firms in Bangalore operate at a number of levels. There are links across sectors and within sectors. One of the most prominent inter-sectoral ties is between local machine tool producers and firms in other sectors. In some cases SMEs are engaged with each other in a variety of subcontracting arrangements. In other cases network cooperation amongst SMEs led to the formation of various consortia. For example, five SME machine tool producers set up a sales and service consortium with six offices country-wide. The marketing and service staff not only responded rapidly to customers' needs, they also channelled feedback and user suggestions to the consortium's member firms. Each of the five member firms produced distinct types of machine tools that complemented rather than competed with each other.

Bangalore's large number of specialized technical institutions providing technical training and general producer services (most set up by the state) are possibly of the greatest significance in fostering network ties. Particularly noteworthy is the Central Machine Tools Institute (CMTI) which is recognized as having played a pivotal role in the development of the machine tools sector. Some of the most innovative and successful engineering firms in Bangalore were founded by CMTI designers who know and trust each other, and exchange ideas and services. Representative trade bodies also played a role by bringing together firms in various sectors and encouraging members to form consortia in order to achieve cooperative gains.

Extracted from K. Nadvi, *Industrial Clusters and Networks: Case Studies of SME Growth and Innovation*, UNIDO, October 1995.

27. Government policy has clearly played an important role in the development of Bangalore's high technology industry. Until the 1980s, India's development strategy was characterized by import substitution policies, which were aimed at nurturing domestic industry, including the high technology knowledge-intensive sectors. This goal led policy makers to create an enabling environment by setting up institutions, particularly in the fields of training and scientific research, as well as creating large state enterprises which generated local downstream linkages. Trade liberalization in the 1980s intensified flexible production arrangements between these large state enterprises and their smaller sub-contractors with greater emphasis on product diversity, quality and design, encouraging the development of localized

technology clusters of specialized SMEs. The success of these clusters attracted a number of leading transnational corporations such as IBM, Philips, Motorola, Hewlett Packard, Siemens, 3M, Texas Instruments, Novell and British Aerospace to Bangalore.

28. Bangalore's pool of highly skilled labour in the knowledge-intensive sectors facilitated its entry into high technology global production networks and the potential to upgrade and reach more profitable positions within these networks. While this example should not be interpreted as a justification for import substitution policies, there is no doubt that the existence of a pool of highly skilled engineers has been a decisive factor in the rapid growth of high-tech industrial networks, which may be difficult to replicate in many developing countries. In some cases, this may imply extensive reforms in the national system of education, and/or the need to promote closer linkages between university, technology agencies and research centres on the one side, and industry on the other.

29. The Bangalore case also displays elements of the "high and low roads to competitiveness". As explained above, a distinction can be made among those forms of competition which focus on innovation and those forms which seek to minimize the reward to labour. In vast labour-surplus LDCs the dynamic tends towards low wage/low technology/low quality in contrast to the high wage/high technology/high quality growth path characterizing the industrial districts in low labour surplus advanced countries (Schmitz, 1990). On the contrary, the Bangalore case shows that it may be possible for innovation and cheap labour to be found within the same firm and hints at some of the conditions (and possible interventions) that would allow low wages and innovation and quality improvements to coexist.

Box 2: Surgical Instrument Cluster of Sialkot in Pakistan

The surgical instrument cluster of Sialkot has faced new challenges arising from the process of liberalization and globalization which questioned the ability of local firms within the cluster to survive and remain competitive in an ever more demand-driven and quality conscious global market. The pressure to raise quality in Sialkot's surgical instrument cluster is acute. Its producers need to meet internationally accepted quality assurance criteria for continued access to advanced country markets. In May 1994 the Food and Drug Administration (FDA) of the United States issued an 'import alert' restricting Pakistani-made surgical instruments from entering the United States on the grounds that they failed to meet internationally accepted quality standards. As a consequence of this effective embargo, export consignments from Sialkot were stranded midway, orders cancelled and many firms in Sialkot ceased operations. By early 1997, however, just over two years after the event, sales of Sialkot-made instruments were above the 1992-1993 levels, overall quality had improved, 75 of the 300 manufacturers within the cluster were certified as conforming with internationally accepted Good Manufacturing Practices (GMP) standards, and one firm had been certified as meeting the ISO 9000 quality assurance requirements.

The local trade association, the Surgical Instrument Manufacturers Association (SIMA), played a pivotal role in developing the cluster's response to the quality assurance crisis. In fact, collective action through SIMA was probably the key factor in bringing about a quality turnaround in the cluster. It began mobilizing member firms and formulating a collective response within a month of the FDA's 'import alert'. As a first step in developing the collective response, the association organized a delegation of local producers, led by its Chairman, to visit Washington and negotiate, on behalf of the cluster, directly with the FDA. Second, it lobbied the Government for financial and technical support. State support to the cluster is unlikely to have occurred without the intervention of SIMA. As a result of SIMA's efforts, State assistance, channelled through the Export Promotion Bureau, was provided to the cluster in its negotiations with the United States authorities. The Government also agreed to cover the cost of hiring an FDA-recognized American quality assurance consultancy firm to train and upgrade 200 local firms to the FDA's GMP certification level. While a few large firms obtained such know-how privately through their foreign buyers or hired individual consultants, SIMA's action in bringing in a quality consultant for the cluster as a whole is what transformed the situation, making such know-how available to most SMEs in the cluster.

In addition, federal support was obtained to finance a SIMA-managed metal testing laboratory and technical training facility for Sialkot which replaced the Metal Industries Development Centre, operated by the provincial government. Finally, SIMA acquired for its members a state-financed revolving credit line to provide soft-term loans to local manufacturers.

There had been a varied set of responses in the relationship of local producers with external buyers. For many large firms this meant closer ties with their leading buyers. In one case the buyer offered to assist by selling the Sialkot firm's instruments under its own brand name and providing its own quality guarantees. Closer ties with lead buyers has also led to a significant transfer of technology to the benefit of many large firms in Sialkot. This is particularly so for those large firms which have entered into joint venture partnerships with leading international producers. In such arrangements the technical responsibility of obtaining ISO 9000 certification, and thus of providing the required technical know-how and training, rests with the foreign partner. As a consequence of the fact that a significant number of local producers have become GMP certified and that prices have fallen, the technical ties between buyers and Sialkot producers often weakened.

Extracted from K. Nadvi, "International competitiveness and small firm clusters - Evidence from Pakistan", *Small Enterprise Development*, March 1998.

30. The differences between the experiences of the large and small enterprises in the Sialkot cluster emphasizes the importance of the provision of specialized support and service institutions for SMEs. Small firms need to have access to a whole range of services which large firms are often able to call upon internally or contract-in and which would not be economically feasible for SMEs. It also suggests that viable small-firm development may be inhibited unless the small firms organize horizontally in some sort of business or sectoral associations, in order to strengthen their bargaining position and hence improve their trading relations. It is also evident that

while large firms seem to have the advantage, the benefits from the efforts made by large firms in raising the quality of their suppliers can be reaped by small firms.

31. Cooperation between the public and private sector was necessary to meet the challenges faced by the cluster. SIMA was instrumental in securing assistance from the Government. Again this emphasizes the need for SMEs to form trade associations not only to be able to lobby the Government for assistance but also to achieve public-private sector dialogue and to participate in the development of SME policy and support measures. Through such dialogue, it was possible to implement the principle of subsidiarity in the provision of support services resulting in a SIMA-managed metal testing laboratory whose credentials and facilities enjoyed international credibility. 2/

Examples of best practices in promoting clusters/networks from scratch

32. While building a dynamic cluster from scratch is a far more difficult task than strengthening existing clusters, lessons can be learned from an analysis of interventions where public measures were designed to establish new networks and foster cooperation among enterprises. Networking among firms can, under certain circumstances, offer an alternative way for SMEs to achieve collective efficiency in those regions or localities where clustering is not common. Network opportunities generally arise wherever firms draw on similar sources of labour and materials, capital equipment, or information technology, or are confronted with similar problems of distribution and marketing. For example, for the last two years the South African Government (Department of Trade and Industry) has been promoting networking of firms in 15 sectors (including motor vehicles, mining equipment, textiles and clothing, chemical industry, farming and food, tourism) in order to discuss and resolve common problems posed by external competition. According to the "cluster approach" they are trying to implement, companies providing support and infrastructure services to the primary producers are also involved, as well as main suppliers and contractors, trade unions and universities. 3/

33. The following box describes the case of PROFO, a programme introduced in 1990 by the Chilean Government in order to foster the creation of SME networks. It provides an example of how policies aimed at creating links among SMEs, and between SMEs and large customers, are able to promote dynamic processes of technological upgrading and also to create a strong focus for the supply of support services. Ultimately, the main lessons from the review of the PROFO programme are that networking can be facilitated through skilled external assistance, that the State can initiate networks and that the provision of a broker or facilitator appears to be the key to the success of this process. His/her role is linked to three pivotal activities: (a) approaching the market as a group, participating at trade fairs or arranging shipping as a group; (b) obtaining a diagnosis of opportunities and problems for the whole group; (c) developing strategies towards ISO 9000 certification, standards and quality.

Box 3. Helping SMEs to Network: Chile's PROFO (Proyectos de Fomento) Programme

The PROFO programme was introduced by the Chilean Government's SMEs promotion agency, SERCOTEC, in 1990. The aim of PROFO is to promote direct cooperation between firms, to increase take-up of other services provided by SERCOTEC and to create focal points in local economies which will act as stimulants for development. PROFOs are based on the assumptions that (i) the biggest problem facing small firms is isolation not size, (ii) that dynamic clusters of firms can have a positive impact on the locality as a whole, and (iii) that the cooperation of the private and public sectors is essential if localities are to develop. The role of the State (SERCOTEC) in this process is to stimulate the participation of private and public sector actors in the locality, to promote the coordination of activities of various agencies, and to promote change and innovation in the relationships between actors.

There are three stages to PROFO development:

(a) Preparation. This involves work by SERCOTEC to identify a particular locality, diagnose their problems and establish the credibility of SERCOTEC itself as an agency which can offer useful support. Scepticism from SMEs has to be overcome by personal contacts and problem-solving directed at individual firms. Any group of firms can ask to form itself into a PROFO, but SERCOTEC must be convinced that a basis for collaboration exists and that there are clear short-term and medium-term goals which might be met. The number of firms is small - usually between 10 and 30.

(b) Consolidation. This is the main part of the process. The first step is to appoint a manager. The manager's role is, initially, to act as an interface between the PROFO's members and their institutional and market environment. One of the first tasks of the manager is to improve the delivery and take-up of support services, and this requires coordination not only with SERCOTEC but also with other local agencies, both private and public. A second task is to develop better relations between participating firms. This is done through such activities as visits to each other's factories, group workshops and group travel. The manager also works towards building the self-esteem of the group and promoting its activities. Once this is achieved, the participants and the manager start to develop competitive advantage based on cooperation.

(c) Independence. The aim of the PROFO initiative is to create groups of enterprises which can develop and sustain their competitiveness, and at the same time encourage other firms in the locality to emulate the experience and inject dynamism into the local economy. For this reason, the managers are appointed for a period of three years, after which the participating firms must take over all support for their salary. The aim is that each group of firms will be self-sustaining.

An evaluation of the PROFO initiative, carried out in 1993, shows that seven out of ten PROFOs which had been in existence for between 20 and 30 months met at least four of the twelve criteria chosen for the evaluation and four of the PROFOs met at least six of the criteria. This indicates a

capacity for collective action, and the ability to upgrade. Firms are not only working together, but also taking initiatives on product and process development, human resource development, sales and finance.

Extracted from J. Humphrey and H. Schmitz, *Principles for Promoting Clusters & Networks of SMEs*, UNIDO, October 1995.

34. As the PROFO case illustrates, networking can also be stimulated by external technical assistance. A UNIDO programme in four countries - Bolivia, Jamaica, Honduras and Nicaragua - has also fostered the creation of networks among small firms where sectoral clusters did not already exist. A recent evaluation carried out by Rabellotti (1998) confirms that "... firms belonging to networks have improved their production process, the quality of their products, and within groups they have been able to introduce product or process specialization, to improve their access to raw materials, to establish common service centres, to obtain credit, to increase their share of the market, and to participate jointly in technical and managerial upgrading programmes". The generation of sectoral networks was carried out in four phases (preparation, consolidation, problem identification, implementation of joint-strategical projects), under the leadership of a national coordinator and with the assistance of a team of national consultants trained to help firms to work together.

IV. Implications for Policy and Support

35. Policies promoting infrastructure, human resource development and technology diffusion play a fundamental role in creating the conditions in which clusters and networks of SMEs can flourish. In practice, the most common initiatives adopted so far are: (1) the creation of *business service centres*, providing collective (sectorally targeted/horizontal, financial/non-financial) services to firms; (2) the creation of *planned industrial estates, science and technology parks, and incubators*, providing basic infrastructure for the start-up of firms and often creating synergetic links with research-oriented institutions; (3) the creation of *technical schools*, designed to improve technical expertise and develop human resource capacities within a local context; (4) the creation of *industrial networking programmes*, aimed at promoting vertical or horizontal commercial linkages among firms (including larger ones); (5) the creation of *information networks*, designed to meet the need for high-speed, low-cost information, and to source technologies and exploit international trade opportunities.

36. However, strictly top-down interventions aimed at reproducing specific models can easily fail. Problems tend to be specific to a region or sector and require tailor-made responses. This means that while macro-policies are needed (such as ensuring a stable currency and exchange rates, controlling inflation, promoting open markets by gradual cuts in tariff rates, streamlining import/export regulations, providing effective infrastructure and protecting property ownership rights), measures to stimulate SME clustering or networking will need to be formulated and also implemented at the local and regional levels, involving as far as possible the private sector. If local conditions are to orient local actions, a progressive shift towards decentralized, flexible, bottom-up, tailor-made policies has to take place.

This is why the meso-level of intervention represents the most appropriate field of action when analysing support structures for promoting local productive systems of small firms. 4/

37. At the meso-level, both policies (mostly regional and local) and institutions (mostly business development service organizations (BDS)) can play a pivotal role in the creation of competitive clusters or networks. If we exclude rather exceptional cases of *direct public purchasing initiatives* directed at groups/consortia of SMEs, 5/ three types of measures have been adopted so far by Governments:

(i) institutional interventions, such as the creation of meso-level institutions where market failure is very likely, but also the stimulation and encouragement of existing institutions. This is the case of the Central Machine Tools Institute established in Bangalore, described in box 1, or the Metal Industries Development Centre established in Sialkot, described in box 2. It also applies to intermediary institutions such as business development service organizations. These fall into two types: (a) non-profit membership organizations such as chambers of commerce, business associations, trade or sectoral associations and cooperatives - created or owned by SMEs to represent their interests and provide their members with services. Although normally financed by fees from their members, these associations often receive government subsidies or external donor support; (b) service delivery organizations, set up by external agents, which may include governmental or semi-governmental organizations, non-profit or non-governmental organizations and commercial private sector enterprises, such as consultancy firms and private training institutions (Donor Committee, 1998).

(ii) Financial interventions, such as loan guarantees, which encourage local banks to lend to SMEs, and the provision of equity, effective lending schemes, tax incentives and direct subsidies in fields like R&D or export promotion. This is the case of the pilot programme launched by the Government in Kumasi to provide credits to small operators such as mechanics cooperatives, the Small Industries Development Fund managed by the State Financial Corporation in India, or the credit programme managed by the Corporacion de Fomento in relation to SERCOTEC support activities in Chile (box 3). Indeed, access to finance is a major constraint for all SMEs, especially in countries where capital markets are weak and banks prefer to lend to larger, supposedly less risky clients. Most SMEs in developing countries are undercapitalized and usually rely on loan capital (i.e. debt) or retained family earnings, which are inadequate for growth. Most recently micro-finance has attracted considerable support, but in the process even less attention is being paid to the needs of SMEs, which are under tremendous pressure to continuously innovate and change. SMEs badly need an injection of equity capital with the investor participating in the risk so that returns are linked to the success of the business (Levitsky, 1997). Preparing a convincing "business plan" may be the vital first step to obtaining the financing in the form of an equity investment. Business service centres can offer substantial help in this respect.

(iii) Regulatory interventions, such as those related to local/sectoral environmental regulations or import policies (i.e. infant industry protection, domestic content regulations, licensing procedures). For example, in the case of Bangalore (box 3), the Indian Department of Electronics adopted a Software

Export Scheme in 1972, under which hardware imports were permitted for the purposes of software development on condition that the price of the hardware was recouped through foreign exchange earnings within five years. Until the mid-1980s, public procurement of software gave priority to Indian companies, while foreign investment was permitted only if bringing about a transfer of technology. As to the environmental regulation, there is an interesting case in Santa Catarina, Brazil, where inter-firm cooperation was stimulated by environmental management pressures generated by external constraints and government regulations (Meyer-Stamer, 1997). A strong environmental orientation can lead up to the creation of eco-industrial parks (EIP), with subtypes such as zero-emissions EIPs or closed-loop manufacturing. The most famous cases have taken place in Denmark and in the United States. Apparently no examples can be found yet in developing countries.

38. At the micro-level it is necessary for individual firms to restructure in response to a changing environment. In order to become a viable "partner" for an inter-firm cooperation agreement (particularly a formal one, and especially with a larger firm), an SME must meet some basic criteria: cost-efficiency, quality, variety/diversification, responsiveness, acceptance of entrepreneurial risks, and a positive attitude towards change and innovation. These factors alone do not give a competitive advantage, but represent prerequisites for surviving in a globalized market. There are, in fact, several programmes, carried out by national and international agencies, which help small businesses to meet the high quality standards required or just-in-time delivery schedules.

39. For example, in Brazil, SEBRAE has launched a programme called "Upgrading for Small Suppliers", which is aimed at small firms that provide large-scale customers with specialized components or services covering either technical or behavioural aspects. In Indonesia, the ASTRA business partnership programme provides training to SMEs, technical assistance through plant visits and apprenticeships, and benchmarking among its subcontractors. Among international organizations, UNIDO has launched a programme on quality, standardization and metrology (QSM), aimed at assisting clients to certify enterprises as meeting internationally accepted quality standards, while simultaneously increasing quality and competitiveness. ITC is also active in this field, providing tools such as "Buying into Competitiveness", which is a modular learning system on international purchasing and supply management for enterprises, the guides to the ISO 9000 quality management systems, or the "International Competitiveness Gauge" and "Global Competitiveness Curriculum" series. Finally, ILO has recently started an International Small Enterprise Programme (ISEP), designed to help existing and potential SMEs to create high quality jobs on a sustainable basis, and presented a report containing a set of recommendations for stimulating job creation in SMEs to the recent International Labour Conference (Geneva, June 1998).

40. In terms of individual firm behaviour, stimulating openness towards change is not an easy task. Short-term planning and traditional habits and practices often induce path-dependent approaches that might be inimical to innovation (Mytelka, 1998). Training programmes and interactive learning processes that sensitize entrepreneurs to the need for change and create a culture of innovation within the firm are therefore crucial. The UNCTAD network is one model of how this can be done. To further strengthen the

innovative capabilities of SME programmes such as Empretec need to be partnered with specialized business support structures such as the UNCTAD pilot network of Centres for Innovation and Enterprise Development.

V. Lessons learned

41. Promoting SME clustering and networking means stimulating competition and cooperation among firms, creating specific locational advantages, and supporting businesses to make the best of a highly competitive environment - ultimately, transforming small individual firms into integrated systems of firms. This can be achieved through three main strategic actions. They should always be tailored to local conditions and based on a participatory, demand-driven, bottom-up approach.

(a) implementing programmes targeting inter-firm networks, supply chains and sectoral clusters targeting knowledge as a major objective;

(b) enhancing the role for intermediary institutions - such as development and promotion agencies - with the private sector taking the lead;

(c) stimulating the emergence of horizontal institutional networks through regional alliances, partnerships, and concertation processes.

42. Some conclusions can be distilled from the examples of best practices:

(a) According to the "Triple C" (collective-cumulative-customer-oriented) approach recommended by Humphrey and Schmitz (1997), the target should not be a single enterprise, but a network of enterprises. Providing "collective" services has two main advantages: (i) it has lower transaction costs than assistance to individual enterprises; (ii) it helps generate relationships between enterprises, improving their efficiency and maximizing the potential of the group through the development of mutual learning. Given that competitiveness is not a static goal, but consists in the ability to attain and sustain a market position, firms should be stimulated to achieve continuous improvement through self-help and become less dependent on external support, thus developing a "cumulative" capacity to upgrade. In addition, interventions should be demand driven ("customer oriented") and not wholly focused on supplying a set of generic services (i.e. training, credit, raw materials and technology). In particular, the formation of networks should be driven by the idea of serving a specific market, and clusters should be stimulated to conquer niche markets and compete on the basis of quality, design, speed of innovation and speed of response to customers' changing needs. Product innovation should be guided continuously by feedback from their customers.

(b) There are many examples demonstrating how the sharing of credits and orders, advanced machines, taking common laboratory tests and quality control certification processes, or participating jointly in training courses, awareness-building workshops (on subjects such as quality, flexibility or efficiency), or trade fairs can stimulate the initial processes of inter-firm dialogue and begin the construction of a relationship of trust and reciprocity among entrepreneurs. Even technical interventions should be explicitly

designed to increase the level of knowledge and to introduce new skills within the local production fabric, while strengthening cooperation and networking dynamics at the same time.

(c) Clear priority should be given to the direct provision of innovative, value-adding services. This is based on the assumption that small firms are unlikely to pay for services that address needs which are still latent, or where the pay-off is in the medium term. In principle, support to SMEs should be provided by the private sector. The public sector should intervene in the case of an initially unfavourable cost/benefit ratio or in cases of 'free riders' (where public goods are concerned). In any event, mechanisms and structures should be conceived in a business-like manner.

(d) Increasing concerns about the cost and impact of the interventions are promoting an examination of BDS (business development services) projects using certain performance criteria, such as cost-effectiveness, sustainability, outreach, replicability, demand-side orientation and benchmarking (Donor Committee, 1998). This refers especially to the way in which objectives are pursued, and does not imply the abandonment of social objectives. In fact, cost-recovery may not be applicable, or not even considered as a priority, when addressing the most disadvantaged groups and the poorest entrepreneurial sectors are addressed.

(e) Isolated support measures (such as training, credit, technological assistance) are not sufficient to foster SME development, be it inside or outside clusters and networks. Services should be integrated or bundled together (i.e. training with innovation, information on partnering and finance, etc.). Services should be provided in an integrated, holistic and systemic manner. The manner and scale of the interventions should always correspond to the ability of the beneficiaries to absorb the assistance they are offered, and should never be forced on recipients. Close attention must therefore be paid during the needs assessment phase when the manner and scale of the interventions are decided.

(f) Initiatives have to be defined and implemented with bottom-up involvement of the main local interest groups, both public and private. This emphasizes the need for long and often costly consensus-building and concertation processes, involving workers and employers either directly or through their associations. Recipients themselves should be in charge of the needs assessment and design process, and not just involved in the programme as end-users. A participative approach is essential if common strategic visions and alliances are to be created on a long-term basis. In general, obstacles to generating changes in attitudes, functions and distribution of power are much more difficult to overcome than strictly technical or technological problems. Moreover, "social" innovation is required to help local actors face global changes.

(g) Technopoles, industrial estates, incubators, and science parks, can all be characterized by high rates of entrepreneurial activity and high-tech start-ups. However, they have often been accused of being artificial and expensive without contributing to the local economy. Evidence shows that such planned forms of enclaves create more global than local linkages; agglomerations of firms perform better if based on already existing

clusters, serving as a start-up or relocation platform under specific external pressure (environmental constraints, technological obsolescence, communication or infrastructural needs, willingness to joining consortia).

(h) Small firm clusters and networks are widely considered to be one of the most cost-effective ways of delivering technical assistance for upgrading technology, management and marketing strategies to SMEs. Thus, the current trend among bilateral and multilateral agencies is not to deliver services directly to enterprises, but rather to focus on the development of meso-level institutions and intermediary organizations. The role of technical assistance has gradually shifted towards developing the capacity of these organizations to deliver services to SMEs, to encourage organizational development processes needed in these organizations for them to be able to represent the interests of their clients effectively. For this approach to succeed, donors should take care to select partner organizations that are already supporting SMEs and are themselves like the SMEs they are servicing, in terms of attitude, motivation, personnel, systems and values.

REFERENCES

Becattini, G.(1990), "The Marshallian Industrial District as a socio-economic notion", in Pyke et al.

Best, M. (1990), *The New Competition. Institutions of Industrial Restructuring*, Cambridge.

Brusco, S. (1990) "The idea of the Industrial District: its genesis", in Pyke et al., 1990.

Dijk van, M. and R. Rabellotti, (eds.) (1997) *Enterprise Clusters and Networks in Developing Countries*, London, Frank Cass.

Donor Committee for Small Enterprise Development (1998), *Business Development Services for SMEs: Preliminary Guidelines for Donor-Funded Interventions*, Washington D.C..

Frobel, F., J. Heinrichs and O. Kreye (1987), *Export Processing Zones in Developing Countries*, ILO, Geneva.

Galhardi, R. (1998), *Maquilladoras Prospects of Regional Integration and Globalization*, ILO, Geneva.

Gibson, A. (1997), "Business Development Services - Core Principles and Future Challenges", *Small Enterprise Development*, September.

Humphrey, J. and H. Schmitz (1995), *Principles for Promoting Clusters & Networks of SMEs*, UNIDO, No. 1, October 1995.

_____ (1996), *Trust and Economic Development*, IDS, Discussion Paper No. 355, August.

IDS (1997), "Restructuring firms to cope in a global community", Sussex, IDS Policy Briefing, Issue 9, February.

Lalkaka, R. (1997), *Lessons from International Experience for the Promotion of Business Incubation Systems in Emerging Economies*, UNIDO, No. 3, November.

Lateef, A. (1997), *Linking up with the Global Economy: A Case Study of the Bangalore Software Industry*, IILS, Geneva, (DP/96/1997).

Levitsky, J. (1996), *Support Systems for SMEs in Developing Countries*, UNIDO, No. 2, March.

Levitsky, J. "Loan Guarantee Schemes for SMEs - an international review" (1997), *Small Enterprise Development*, June.

Maillat, D. (1996), "Du district industriel au milieu innovateur: une contribution à une analyse des organisations productives territorialisées", Working Papers, Université de Neuchatel, novembre.

Meyer-Stamer, J., T. Altemburg and W. Hildebrand (1998), *Building Systemic Competitiveness, Concept and Case Studies from Mexico, Brazil, Paraguay, Korea and Thailand*, German Development Institute, Berlin.

Meyer-Stamer, J. and T. Altemburg, "Fostering cooperation: Experiences in Latin American clusters", *World Development Special Issue* (forthcoming).

Mytelka, L. (1997), "Industrial upgrading qua competitiveness", paper prepared for the SSRC Working Group Meeting on Industrial Upgrading, New York, October.

Nadvi, K. (1995), *Industrial Clusters and Networks: Case Studies of SME Growth and Innovation*, UNIDO, October.

Nadvi, K. and H. Schmitz (1997), "SME responses to global challenges: Case studies of private and public initiatives", paper presented at the Seminar on New Trends and Challenges in Industrial Policy, UNIDO, Vienna, October.

Nurse, K. (1995), "The developmental efficacy of the export-oriented clothing industry: the Jamaican Case", *Social and Economic Studies*, No. 44.

OECD (1996), *Technology, Productivity and Job Creation*, Paris.

OECD (1997), *Local Development and Business Incubators: Experiences on Enterprise and Job Creation*, Local Economic and Employment Development, Rome.

OECD (1998), *Fostering Entrepreneurship, a Thematic Review*, Paris.

Oyelaran-Oyeyinka, B. (1997), *Nnewi: An Emergent Industrial Cluster in Nigeria*, Ibadan, Technopol Publishers.

Porter, M. (1990), *The Competitive Advantage of Nations*, London, Macmillan.

Powell, J. (1995), *The Survival of the Fitter: Lives of Some African Engineers*, Intermediate Technology Publications, London.

Pyke, F., G. Becattini and W. Sengerberger, (1990), *Industrial Districts and Inter-Firm Co-operation in Italy*, ILO, Geneva.

Pyke, F. and W. Sengenberger (eds) (1992), *Industrial Districts and Local Economic Regeneration*, IILS, Geneva.

Pyke, F. (1994), *Small firms, technical services and inter-firm cooperation*, IILS, Geneva.

Rabellotti, R. (1998), "Helping small firms to network - the experience of UNIDO", *Small Enterprise Development*, March.

Schmitz, H. (1989), "Flexible Specialization: a new paradigm of small-scale industrialization", IDS Discussion Paper No. 621, Brighton.

UNCTAD (1994). *Technological Dynamism in Industrial Districts: An Alternative Approach to Industrialisation in Developing Countries?* (UNCTAD/ITD/TEC/11) (United Nations publication, Sales No. E.94.II.D.3), New York and Geneva.

Van Heerden, A. (1998), "Export processing zones: the cutting edge of globalization?", paper presented at the International Workshop on Global Production and Local Jobs, IILS, Geneva.

Notes

1/ This concept, coined by Schmitz (1989), helps to capture the competitive advantage derived both from local external economies and from joint action. The former are "incidental benefits" arising from proximity (such as availability of specialized suppliers, buyers of outputs, skilled workers, information about new developments, etc.). The latter are more consciously pursued, and can relate to individual firms cooperating (i.e. lending each other equipment), or to groups of firms joining forces in business associations, producers' consortia, etc. Joint action can be both horizontal (i.e. sharing a large order) or vertical (i.e. a supplier redesigning a component with the customer). For further details, see also *Technological Dynamism in Industrial Districts: an Alternative Approach to Industrialization in Developing Countries?*, UNCTAD/ITD/TEC/11, Geneva, 1994.

2/ For a more detailed and general discussion on the importance of public-private sector dialogue, the principle of subsidiarity, trade associations and the representation of SMEs, see Report of the Expert Meeting on Government and Private Sector Roles and Interactions in SME Development, (TD/B/COM.3/6: TD/B/COM.3/EM.2/3).

3/ The DTI cluster project is a local initiative, but is supported by the World Bank. Until now, scientific investigations of the sectors and joint working sessions to discuss them have been carried out, while strategic action plans are apparently at their initial stage of implementation. The wheat, millers and bakery cluster sub-sectors seem to have already obtained

remarkable results, as well as the wool and mohair, motor vehicle and capital goods sectors. *Finansies & Tegniek Magazine*, 21 and 24 October 1997.

4/ Meyer-Stamer, Altemburg and Hildebrand (1998) argue that successful industrial development requires action at different levels: the macro-level of generic economic conditions, the meso-level of specific policies and institutions, the micro-level of firms and inter-firm cooperation, and the meta-level of cultural values, strategic visions and socio-economic alliances.

5/ One of the best known and successful cases, reported by Humphrey and Schmitz, (1997) has taken place recently in the State of Ceara in the Brazilian Northeast, where a procurement of wooden wheel-barrows has stimulated a large woodworking industry for export furniture to grow.